MWI 8550.1
REVISION A
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MARSHALL WORK INSTRUCTION

AD01

WASTE MANAGEMENT

DOCUMENT HISTORY LOG

Status (Baseline/ Revision/ Canceled)	Document Revision	Effective Date	Description
Baseline		4/8/02	
Revision	A	12/3/02	Removed references to MWI 8540.1, “Pollution Prevention,” in paragraphs 3.3 and 6.5.1.

1. PURPOSE

This Marshall Work Instruction (MWI) establishes the method of compliance for waste operations, specifically new or existing hazardous waste streams, chemical product and unknown chemical disposal activities, empty container management, medical waste management, and debris disposal at Marshall Space Flight Center (MSFC). This MWI provides instructions for the requirements provided in Marshall Procedures and Guidelines (MPG) 8500.1, "MSFC Environmental Management Program."

2. APPLICABILITY

This MWI applies to MSFC employees, contractors, and subcontractors (including leased facilities) that generate waste at MSFC.

3. APPLICABLE DOCUMENTS

3.1 40 Code of Federal Regulations (CFR) Part 260, General

3.2 40 CFR Part 261, Identification and Listing of Hazardous Waste

3.3 40 CFR, Subpart D, Part 268

3.4 49 CFR Part 173.29(b)

3.5 ADEM Rule 335-14-3-.03(5)(c)2 (Hazardous Waste Containers)

3.6 ADEM Rule 335-14-6-.02(7) (Hazardous Waste Personnel Training)

3.7 Directorate of Environmental Management Planning Standard Operating Procedure (EMP-SOP) Number 420-47-2

3.8 MPG 1800.1, "Bloodborne Pathogens"

3.9 MPG 8500.1, "MSFC Environmental Management Program"

3.10 MWI 8715.10, "Explosives, Propellant, and Pyrotechnics Program"

3.11 Resource Conservation and Recovery Act (RCRA), Subtitle C and D

4. REFERENCES

MSFC Pollution Prevention Plan (updated annually)

5. DEFINITIONS AND ACRONYMS

5.1 Acutely Hazardous Waste. All P-listed wastes and other hazardous wastes with the designated Hazard Code H. Hazard Code H is the RCRA designation for acutely hazardous waste. P-listed wastes are identified in 40 CFR Part 261.

5.2 CFR. Code of Federal Regulations

5.3 Chemical product. Chemicals in original containers that are no longer needed.

5.4 Controlled Waste. Waste streams not classified as hazardous (according to regulation) but that require specific processing, handling, or disposal different from other solid wastes.

5.5 Debris. Solid material exceeding a 60-millimeter particle size intended for disposal, and is a manufactured object, plant or animal matter, or natural geologic material. However, the following materials are not debris: (a) any material for which a specific treatment standard is provided in 40 CFR, Subpart D, Part 268, (namely lead acid batteries, cadmium batteries, and radioactive lead solids); (b) process residuals such as smelter slag and residues from the treatment of waste, wastewater, sludges, or air emission residues; and (c) intact containers of hazardous waste not ruptured but retain at least 75 percent of their original volume. A mixture of debris that has not been treated to the standards provided by 40 CFR Part 268.45 and other material is subject to regulation as debris if the mixture is comprised primarily of debris, by volume, based upon visual inspection.

5.6 EED. Environmental Engineering Department

5.7 EPA. Environmental Protection Agency

5.8 Hazardous Waste. A waste or combination of wastes that can pose a substantial or potential hazard to human health or the environment when not properly managed; possesses at least one of four characteristics (ignitable, corrosive, reactive, or toxic) or appears on special U.S. Environmental Protection Agency (EPA) lists; includes toxic waste, spilled materials, and unused chemicals.

5.9 HWSF. Hazardous Waste Storage Facility (Building 4640)

5.10 Inadequately Identified Chemical Substance. A chemical/chemical formulation offered for disposal, for which partial or incomplete information is available regarding the material's identity. The information may be sufficient for the material to be handled safely, transported onsite, and temporarily stored, provided reasonable judgment is applied. Examples of incompletely identified chemical substances include those which cannot be positively or reasonably identified by the assigned Point of Contact (POC). The POC can provide no reliable information regarding identity of, or potential use for, the chemical substance. In addition, the container holding the chemical material has incomplete or illegible information and no Material Safety Data Sheet (MSDS) is associated with the container contents.

5.11 Inner Liner. A continuous layer of material placed inside a tank or container that protects the construction materials of the container from contact with the contained waste or reagents used to treat the waste.

5.12 Material Safety Data Sheet (MSDS). Information, written or printed material, supplied by chemical manufacturers/importers, that provides pertinent safety and health information concerning a hazardous chemical.

5.13 Medical Waste. MSFC generates medical waste in several locations onsite. The types of medical waste generally produced are (a) biohazardous sharps; (b) blood and body fluids; (c) microbiological waste; (d) surgical waste; and (e) disposable vials, tubes, culture flasks, paper products, containers, latex gloves, face masks, etc. To ensure proper disposal and handling, the Environmental Engineering Department (EED) has provided specific standards and guidelines. Handling of medical waste or other potential infectious materials will be done in accordance with MPG 1800.1, "Bloodborne Pathogens." Emergency medical personnel are responsible for the collection and proper disposal of emergency medical waste.

5.14 POC. Point of Contact

5.15 Resource Conservation and Recovery Act (RCRA) Empty. A container is considered "RCRA empty" when the hazardous waste remaining in the container (or inner liner) is not subject to regulation under RCRA Subtitle C.

5.16 SAA. Satellite Accumulation Area

5.17 Special Waste. A waste that does not fall into the categories of hazardous or nonhazardous waste; examples of special waste at MSFC are spray-on foam insulation and media blasting debris.

5.18 SWMA. Solid Waste Management Area

5.19 Unknown Chemical Substance. A chemical/chemical formulation, offered for disposal for which no information is available regarding the identity of the material. Unknown chemical substances include those for which the POC can provide no information regarding the identity of or intended use for the chemical, and the container holding the material (frequently not original product container) has no identifying marking or labeling. Often the container cannot be properly sealed and is not intended for use in transporting a hazardous chemical or substance. Containers previously used to hold unknown chemical substances include: various types of laboratory glassware (beakers, flasks, reaction vessels, graduated cylinders, etc.), metal/plastic cans, pails and drums, and plastic bags in various configurations and sizes.

5.20 Universal Waste. Those wastes that would normally be regulated as hazardous wastes, but that have been classified as “universal wastes” with alternative management standards. Examples include batteries, pesticides, mercury-containing thermostats, and lamps.

6. INSTRUCTIONS

Under RCRA, the handling, storage, and ultimate disposition of wastes are closely regulated. RCRA provides a “cradle to grave” management system for the disposition of hazardous wastes.

6.1 Instructions for Management of New or Existing Waste Stream.

6.1.1 The MSFC user organization shall identify all expected hazardous or controlled waste-producing processes prior to beginning the process and submit the MSDSs and MSFC Form 4072, “Process Waste Questionnaire,” to EED.

6.1.2 EED shall evaluate the need for collecting the waste stream. If not a hazardous, universal, or controlled waste, the material will be disposed in the regular trash/debris.

6.1.3 EED shall issue a Satellite Accumulation Area (SAA) container at each SAA for each waste stream requiring collection.

6.1.4 The MSFC user organization shall ensure that each hazardous and controlled waste is: (a) properly accumulated for disposal and placed in the correct container at or near the point of generation; (b) inspected every week; (c) compatible with the container and other collocated hazardous materials/waste; (d) properly labeled to identify contents and hazards; (e) in good condition; (f) closed/sealed when not in use; (g) handled and stored in a manner to prevent rupture or leakage from the container; (h) reported, if any changes in the hazardous waste-producing process occurs, by submitting MSFC Form 4072 to the EED; (i) verified for accuracy of the waste stream profile as requested; and (j) ensured that less than 55 gallons of waste have been accumulated at the SAA.

6.1.5 EED shall inspect each SAA monthly.

6.1.6 The MSFC user organization shall turn in containers by dialing the phone number printed on the container label on the day each has been filled (90 percent for liquid containers) and mark the date on the container identification label. The following information will be required for turn in of container: container number, user name, building, and room number.

6.1.7 The MSFC user organization shall request a replacement container if needed. If the waste generation has ceased, the EED should be notified.

6.1.8 EED shall pick up the turned-in container(s) within 72 hours and issue new containers within 24 hours as requested.

6.1.9 EED shall move containers to the Hazardous Waste Storage Facility (HWSF) for proper offsite disposal.

6.2 Instructions for Disposal of Chemical Product.

6.2.1 MSFC user organizations shall turn in chemical products no longer needed in original packaging along with MSDSs for each chemical product. Chemicals that should be turned in are those that can no longer be used but may have value to another department or outside company. All opened and unopened containers no longer needed shall be turned in to EED.

6.2.2 EED shall determine if the chemical can be used by another department or outside company. If not, it will then be considered a waste.

6.2.3 If the chemical is considered a waste, EED will determine if an existing MSFC user organization SAA container is available that the chemical/product can be poured into. If an SAA

container is available, the MSFC user organization will be instructed to place the material in said container. If the chemical is determined by EED to pose a shock or explosive hazard, MWI 8715.10, “Explosives, Propellant, and Pyrotechnics Program” will be followed for disposal.

6.2.4 If no container is available for the waste, the MSFC user organization shall request EED to remove the chemical product.

6.2.5 EED shall inspect chemical product containers at the MSFC user organization locations to verify that the containers are ready for transport.

6.2.6 EED shall verify that the containers are not leaking. If leaking, the container will be overpacked as needed.

6.2.7 EED shall move the chemical product containers to the HWSF within 72 hours.

6.2.8 EED shall properly dispose of chemical product containers.

6.3 Instructions for Unknown and/or Inadequately Identified Chemicals.

6.3.1 MSFC user organizations shall notify the EED of unknown and/or inadequately identified chemicals. The notification to the EED shall include the following information:

6.3.1.1 The location of the unknown chemicals. (Locations near work areas occupied by large numbers of employees or corridors with high personnel traffic will receive the highest priority. Locations with mission-critical or high-value equipment will also dictate an expedited removal schedule.)

6.3.1.2 The type and condition of containers holding these materials.

6.3.1.3 The number of containers and the quantity of material.

6.3.2 EED shall inspect the unknown and inadequately identified chemical product containers at the MSFC user organization locations to verify that the containers are ready for transport.

6.3.3 EED shall verify that the containers are not leaking. If leaking, the container will be overpacked as needed.

6.3.4 EED shall move the unknown and inadequately identified chemical substance containers to temporary storage.

6.3.4.1 Temporary storage for unknown chemical substance containers shall be at the MSFC user organization location. The EED shall suggest best management practices to the MSFC user organization during the temporary storage. The unknown chemical substance containers will remain under control of the MSFC user organization until the unknown chemical substance is identified and removed from MSFC (in less than 90 days from notification.) This approach eliminates unnecessary risk, associated with handling and transport of unknown chemical substances to MSFC employees. The areas where unknown chemical substances are stored at MSFC are under engineering controls and are typically safer than open storage at the HWSF.

6.3.4.2 Temporary storage for inadequately identified chemical substance containers shall be at the HWSF.

6.3.5 EED shall inspect the unknown and inadequately identified chemical substances to identify the material for removal from MSFC.

6.3.6 EED shall arrange for the removal and disposal of unknown and inadequately identified chemical substances from MSFC.

6.3.7 EED shall document unknown and inadequately identified chemical materials on an “Unknown Chemical Log.” All pertinent information regarding both unknown and inadequately identified chemical substances will be recorded. This information will be provided to the waste disposal vendor to assist in the safe and efficient removal of these wastes from MSFC.

6.4 Instructions for Management of Empty Containers.

The regulations at 40 CFR Part 261.7 define when hazardous waste residue in an empty container is exempt from regulation. These regulations define the requirements for rendering a container or inner liner "empty." To distinguish between the usual meaning of the word "empty" and the strict regulatory definition, the phrase "RCRA empty" is often used. Any hazardous waste remaining in either a RCRA empty container or inner liner is not subject to regulation under RCRA Subtitle C. EPA promulgated these regulations to provide guidance to owners and operators on how to empty their containers so that containers are no longer subject to regulation, even if some residues remain in the container.

To protect the environment and to ensure proper handling of empty containers, the EED provides specific standards and guidelines as follows:

6.4.1 The MSFC user organizations are responsible for the proper management of empty containers to protect employee safety and the environment.

6.4.2 The MSFC user organization shall properly manage empty container(s) that have contained chemical products by ensuring turn-in to the EED on a regular and frequent basis.

6.4.3 The MSFC user organization shall ensure that an empty container that held compressed gases has a pressure in the container that approaches atmospheric pressure.

6.4.4 The MSFC user organization shall ensure that an empty container or inner liner of a container is empty by all practical means, such as pumping, pouring, or aspirating. Do not rinse out containers unless requested by EED.

6.4.5 The MSFC user organization shall ensure that container bungs and/or tops are in place prior to storage/turn-in and on pallets (5-gallon and 1-gallon containers shall be stacked no more than two high). Retain markings, placards, or labels on empty containers as required by Department of Transportation regulation [49 CFR Part 173.29(b)].

6.4.6 The MSFC user organization shall notify the EED and furnish the following information for turn-in of empty containers: name, office symbol, NASA/contractor, telephone number, total number of empties, container size(s), storage location, and the chemical last contained.

6.4.7 EED shall inspect containers to verify that they are empty.

6.4.8 EED shall remove and properly manage container(s) from MSFC user organizations.

6.5 Instructions for Management of Debris.

6.5.1 The MSFC employees, supervisors and user organizations shall recycle debris that is recyclable, such as metal, toner cartridges, aluminum cans, and white paper. The MSFC Pollution Prevention Plan addresses the wide range of recycling initiatives at MSFC. See MPG 8500.1 for other recycling guidelines.

6.5.2 Construction and maintenance contractors shall dispose of debris at the Solid Waste Management Area (SWMA) that is unacceptable at the City of Huntsville Incinerator. The SWMA is the onsite construction and demolition landfill operated by Redstone Arsenal. Disposal of debris or special waste at the SWMA

will be in accordance with EMP-SOP Number 420-47-2. The following are **unacceptable** as debris for the Huntsville Incinerator:

6.5.2.1 Liquids of any type.

6.5.2.2 Ammunitions and explosive-type materials.

6.5.2.3 Containers of 1 gallon or larger that contain material such as paint solvents or similar material.

6.5.2.4 Empty drums of 5 gallons or larger in good condition.

6.5.2.5 Special waste other than asbestos.

6.5.2.6 Universal waste including batteries, pesticides, and mercury-containing thermostats and lamps.

6.5.3 If the debris consists of large, bulky items, the construction and/or maintenance contractor shall do the following:

6.5.3.1 Separate trees and tree debris, stumps, and yard waste from other inert materials.

6.5.3.2 Separate all construction debris from dirt and rock (dirt, or spoil material, from construction and maintenance activities is acceptable for disposal).

6.5.3.3 Separate all salable/reusable metal from construction debris (scrap metal including aluminum, copper, and metal shavings are not acceptable items for disposal at the SWMA).

6.5.3.4 Flatten empty drums of 5 gallons or larger in poor condition prior to disposal.

6.5.4 Prepare a Manifest of Material, Form ASMI-RA 2435, for items delivered to the Redstone Arsenal SWMA (this is required for each load received at the SWMA).

6.5.5 To ensure compliance, the SWMA shall randomly inspect loads and possibly refuse material that is noncompliant.

6.5.6 Employees shall collect debris that is unacceptable at the SWMA in trash bins located at MSFC for incineration at the City of Huntsville Incinerator.

6.6 Instructions for Handling Medical Waste.

6.6.1 The MSFC user organization shall identify all expected

medical waste-producing processes prior to beginning the process and submit the MSDS and MSFC Form 4072 to EED.

6.6.2 EED will evaluate the need for collecting the waste stream. If not a medical waste, the debris will be disposed in regular trash.

6.6.3 EED and affected organizations shall jointly determine if the medical waste or equipment shall be treated onsite and/or disposed in SAA containers.

6.6.4 The MSFC user organizations shall: (a) autoclave reusable equipment and glassware containers prior to reuse and ensure proper treatment by affixing temperature sensitive tape to each bag, container, or sterilization packets or "envelopes" that have a temperature sensitive "dot" that verifies treatment; (b) treat plastic containers with a 10 percent solution of bleach to render them nonhazardous and dispose as regular trash; (c) autoclave liquid culture media to render it nonhazardous and wash down the sink with copious amounts of water (this type of autoclaving requires that a *Bacillus stearothermophilus* spore test kit be utilized once a month to evaluate effectiveness of the autoclave; each event in the autoclave shall be recorded on a computer printout of each cycle, which gives date, time, exposure temperature (minimum/maximum), exposure pressure (minimum/maximum psi), and cycle time); and (d) treat blood and blood products that are to be poured into the sink (sanitary sewer) with a 10 percent solution of bleach with a retention time of approximately 30 minutes to render them non-hazardous and wash down the sink with copious amounts of water.

6.6.5 EED will provide SAA container(s) for each medical waste stream requiring collection. Containers will: (a) utilize red lettering with a contrasting background color and be conspicuously labeled “BIOHAZARDOUS”; and (b) be impermeable to moisture and have strength that prevents ripping, tearing, or bursting under normal conditions of use and be single-use, burnable containers to be destroyed in incinerators.

6.6.6 The MSFC user organization shall accumulate medical waste so that waste is: (a) collected in segregated, designated medical waste containers and kept separated from all other solid waste streams; (b) placed directly into leak proof, rigid, puncture-resistant containers for sharps and sealed to prevent loss of contents; (c) handled in a manner to protect the integrity of the packaging; (d) at or near the point of generation and secure to prevent entry of unauthorized persons; (e) compatible with the container and other co-located hazardous materials/wastes; (f) properly labeled to identify contents and

hazards; (g) in good condition; (h) closed/sealed when not in use; and (i) reported if any changes in the medical waste-producing process occurs by submitting MSFC Form 4072 to EED.

6.6.7 Medical waste is collected from the MSFC Medical Center weekly due to high volume. EED will typically collect medical waste monthly from other MSFC user organization locations. If MSFC user organizations require a more frequent collection of medical waste, please contact EED. Upon pickup of the collection container, a new container will be issued unless EED is notified otherwise.

6.6.8 EED will ensure proper disposal of medical waste.

7. NOTES

Residues remaining in a RCRA empty container are exempt from RCRA Subtitle C regulation. Likewise, residues removed from an empty container (i.e., removed after the container meets the regulatory definition of empty) are also exempt from RCRA Subtitle C requirements. In contrast, residues removed from a container that is not RCRA empty or residues that result from rendering a container empty are fully subject to RCRA Subtitle C.

A recurring issue within the container and empty container regulations is the puncturing or venting of aerosol cans. The issue stems partly from the applicability of the empty container regulations to aerosol cans and partly from the issue of whether the can is considered to be part of the waste. In general, aerosol cans are capable of holding either compressed gas or liquid. If the can is sent for scrap metal recycling, the can and its contents are exempt from regulation as a scrap metal under 40 CFR 261.6(a)(3)(iii). The act of emptying the can may be an exempt recycling activity under 40 CFR Part 261.6(c), and any residues from emptying the can would be regulated if they are listed as or exhibit a characteristic of hazardous waste. If the can is sent for disposal, both the contents of the can and the can itself are subject to regulation. To dispose of the aerosol can as nonhazardous, the can must be RCRA empty and the can itself must not qualify as a hazardous waste.

8. SAFETY PRECAUTIONS AND WARNING NOTES

Chemical substances suspected to be Class-A explosives shall be disposed in accordance with MWI 8715.10, “Explosives, Propellant, and Pyrotechnics Program.” Unknown and inadequately identified chemical substances, suspected to be Class-A explosives, are not handled by EED.

9. RECORDS

9.1 MSFC Form 4072, “Process Waste Questionnaire,” is maintained by EED for 3 years as part of RCRA records, then destroyed or maintained for historical purposes, per NASA Records Retention Schedule 8/43.B.

9.2 Manifest of Material, Form ASMI-RA 2435, is maintained by EED for 3 years as part of RCRA records, then destroyed or maintained for historical purposes, per NASA Records Retention Schedule 8/43.B.

10. PERSONNEL TRAINING AND CERTIFICATION

10.1 Hazardous Waste Operations and Emergency Response (HAZWOPER) Training

Per MPG 8500.1, employees designated to participate in emergency response operations or site remediation must be trained and certified before taking part in actual emergency operations and must receive annual refresher training. Annual refresher training is provided by EED and meets OSHA 29 CFR 1910.120 requirements. Records of training and certification shall be retained by the employer for not less than 5 years.

10.2 Hazardous Waste Personnel Training (ADEM Rule 335-14-6-.02(7))

Per MPG 8500.1, training and certification must be given to all hazardous waste operations personnel working at the HWSF. This training must occur within 6 months of being hired, with employees not working in an unsupervised capacity until they are trained. Training must be renewed every 365 days. The employer shall retain records of training and certification for not less than 5 years.

10.3 Chemical Inventory Reporting Training

Per MPG 8500.1, all personnel using any hazardous chemicals must attend this training. This training is necessary for MSFC to maintain an accurate chemical inventory for reporting purposes.

11. FLOW DIAGRAM

Flow diagrams are provided for handling disposal of new or existing waste streams (Figure 1), chemical products (Figure 2),

unknown or inadequately identified chemicals (Figure 3), and medical waste (Figure 4).

12. CANCELLATION

MWI 8550.1 Baseline dated April 8, 2002

Original signed by
Axel Roth for

A. G. Stephenson
Director

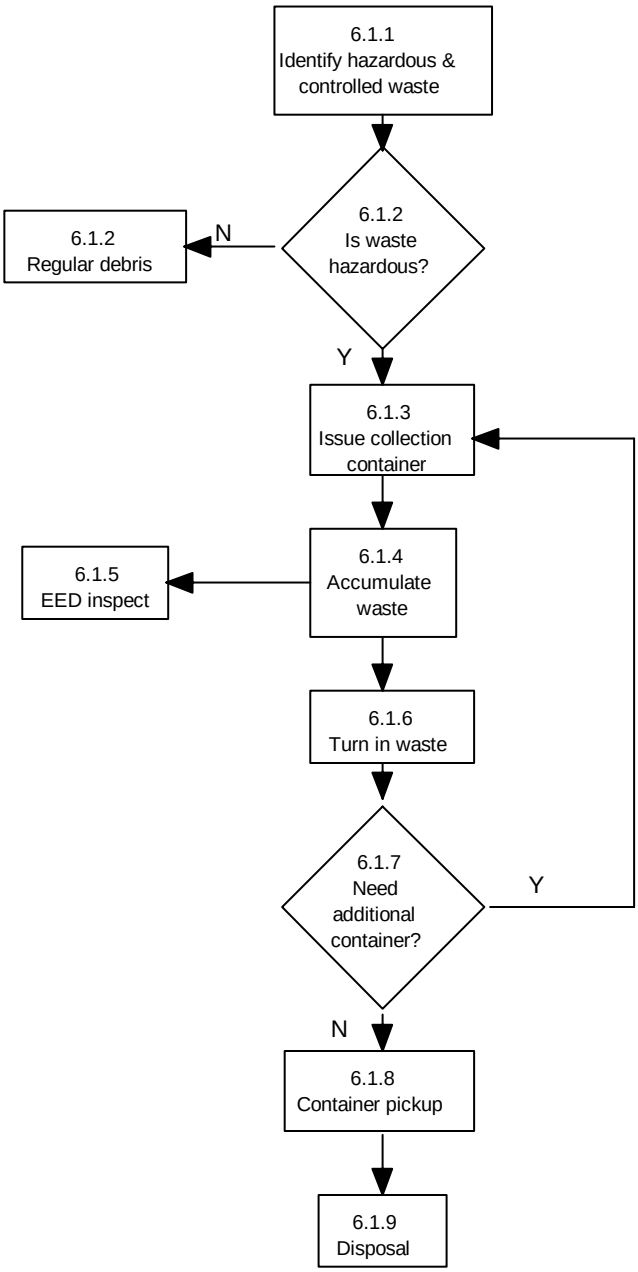

Figure 1. Flow Diagram for New or Existing Waste Stream

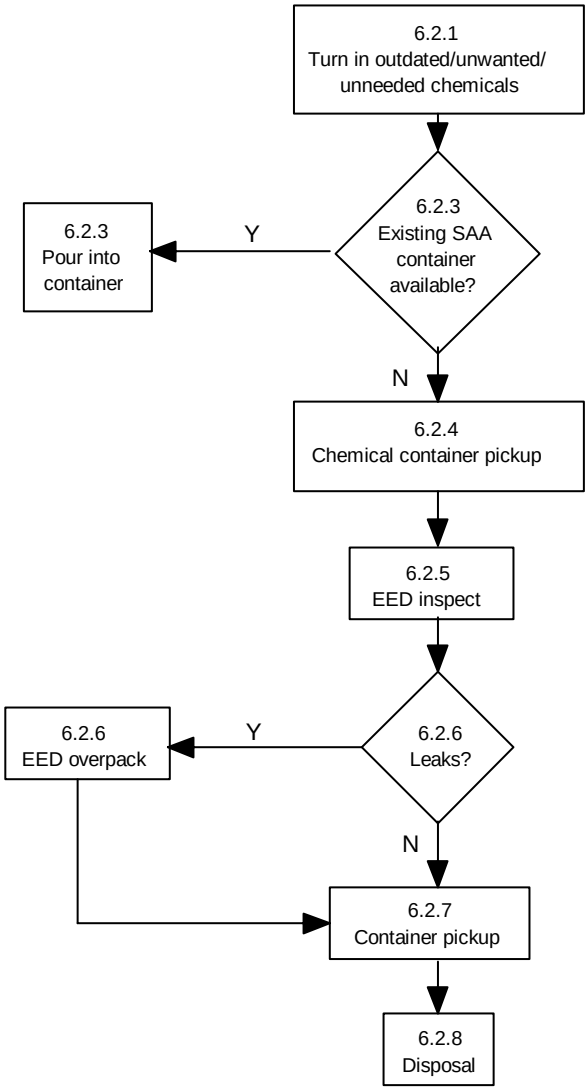

Figure 2. Flow Diagram for Chemical Product Disposal

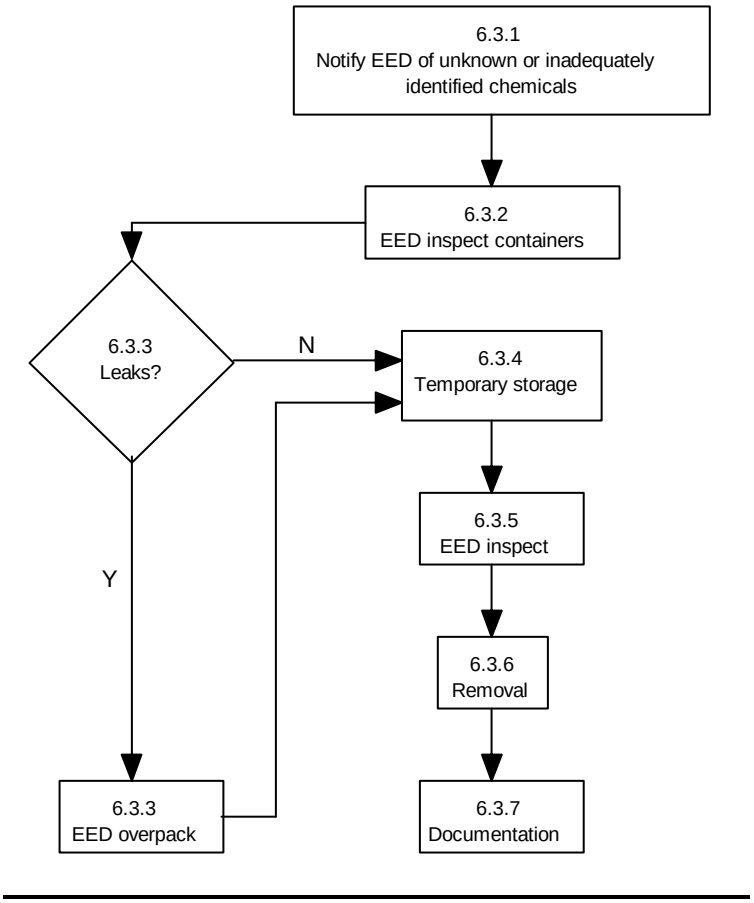

Figure 3. Flow Diagram for Unknown or Inadequately Identified Chemicals

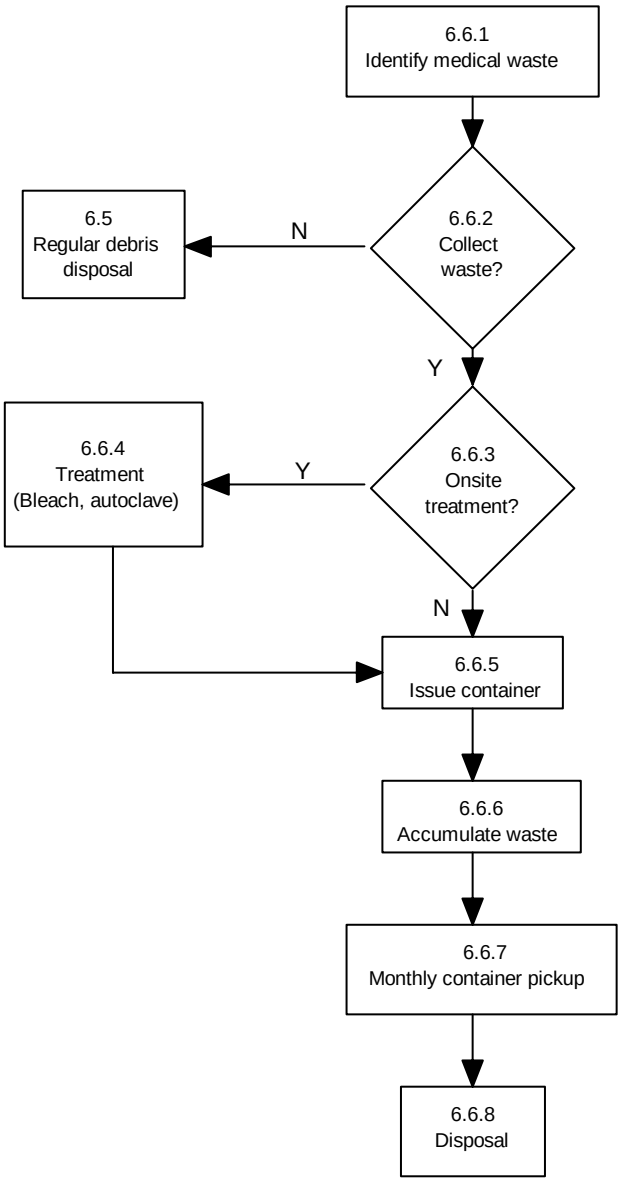

Figure 4. Flow Diagram for Medical Waste Management